

CLAIMS

1 1. A welding type power source capable of
2 receiving a range of input voltages and frequencies,
3 comprising:
4 an input circuit configured to receive an
5 input power signal having an input frequency and an
6 input magnitude and provide a first signal having a
7 magnitude responsive to the input magnitude;
8 a preregulator configured to receive the
9 first signal and provide a dc second signal having a
10 preregulator magnitude independent of the input
11 magnitude;
12 an output circuit configured to receive the
13 dc second signal and provide a welding type output
14 power signal having an output frequency independent of
15 the input frequency and having an output voltage
16 independent of the input voltage;
17 a preregulator controller, connected to the
18 preregulator, and further having a controller power
19 input; and
20 a control power circuit configured to receive
21 the dc second signal and provide a control power signal
22 to the controller power input, wherein the controller
23 power signal has a control power magnitude independent
24 of the input magnitude and a control frequency
25 independent of the input frequency.

1 2. The apparatus of claim 1, wherein the input
2 circuit includes a rectifier.

1 3. The apparatus of claim 1, wherein the
2 preregulator magnitude is greater than the first magnitude.

1 4. The apparatus of claim 3, wherein the
2 preregulator includes a boost converter.

1 5. The apparatus of claim 4, wherein the boost
2 converter includes a slow voltage switched switch and a slow
3 current switched switch.

1 6. The apparatus of claim 3, wherein the output
2 circuit includes an inverter.

1 7. The apparatus of claim 3 wherein the output
2 circuit includes a switched snubber.

1 8. The apparatus of claim 3, wherein the
2 preregulator magnitude is greater than the control power
3 magnitude.

1 9. The apparatus of claim 3 wherein the control
2 power circuit includes a buck converter.

1 10. A welding type power source capable of
2 receiving a range of input voltages and frequencies,
3 comprising:

4 an input rectifier configured to receive an
5 input power signal having an input frequency and an
6 input magnitude and to provide a rectified signal
7 having a rectified magnitude responsive to the input
8 magnitude;

9 a slow voltage switched and slow current
10 switched boost converter configured to receive the
11 rectified signal and provide a boost dc signal having a
12 boost magnitude greater than and independent of the
13 rectified input magnitude;

14 an output circuit, including an inverter with
15 a switched snubber, connected to receive the dc second

16 signal and to provide a welding type power output
17 having an output frequency independent of the input
18 frequency and having an output voltage independent of
19 the rectified magnitude;
20 a controller, connected to the converter and
21 further having a controller power input; and
22 a control power circuit, including a buck
23 converter connected to receive the boost dc signal and
24 provide a control power signal to the controller power
25 input, wherein the controller power signal has a
26 control power magnitude less than and independent of
27 the boost magnitude.

1 11. A method of providing welding type power from
2 a range of input voltages and frequencies, comprising:
3 receiving an input power signal having an
4 input frequency and an input magnitude;
5 providing a first signal having a magnitude
6 responsive to the input magnitude;
7 converting the first signal into a dc second
8 signal having a second magnitude independent of the
9 input magnitude;
10 providing an output power signal derived from
11 the dc second signal, wherein the output power signal
12 is a welding type output and has an output frequency
13 independent of the input frequency and further has an
14 output voltage independent of the input voltage; and
15 converting the dc second signal into control
16 power, wherein the control power has a control power
17 magnitude independent of the input magnitude.

1 12. The method of claim 11, wherein providing a
2 first signal includes rectifying an ac signal.

1 13. The method of claim 11, wherein the second
2 magnitude is greater than the first magnitude.

1 14. The method of claim 13, wherein converting
2 the first signal into a dc second signal includes boost
3 converting the first signal.

1 15. The method of claim 13, wherein boost
2 converting the first signal includes a slow voltage
3 switching and slow current switching a switch.

1 16. The method of claim 13, wherein providing an
2 output power signal includes inverting the dc second signal.

1 17. The method of claim 13 wherein inverting the
2 dc second signal includes switching a snubber.

1 18. The method of claim 13, wherein the second
2 magnitude is greater than the control power magnitude.

1 19. The method of claim 13 wherein converting the
2 dc second signal into control power includes buck converting
3 the dc second signal.

1 20. A method of providing welding type power from
2 a range of input voltages and frequencies, comprising:
3 rectifying an input power signal having an
4 input frequency and an input magnitude to provide a
5 rectified signal having a rectified magnitude
6 responsive to the input magnitude;
7 boost converting, including slow voltage
8 switching and slow current switching, the rectified
9 signal to provide a boost dc signal having a boost
10 magnitude greater than and independent of the rectified
11 input magnitude;

12 inverting, including switching a snubber, the
13 dc second signal to provide a welding type power output
14 having an output frequency independent of the input
15 frequency and having an output voltage independent of
16 the rectified magnitude; and

17 buck converting the boost dc signal to
18 provide a control power signal, wherein the control
19 power signal has a control power magnitude less than
20 and independent of the boost magnitude, and a control
21 frequency independent of the input frequency.

1 21. A welding type power source capable of
2 receiving a range of input voltages and frequencies,
3 comprising:

4 input means for receiving an input power
5 signal having an input frequency and an input magnitude
6 and for providing a first signal having a magnitude
7 responsive to the input magnitude;

8 converting means for converting the first
9 signal into a dc second signal having a magnitude
10 independent of the input magnitude, wherein the
11 converting means is connected to receive the first
12 signal;

13 means for providing a welding type output
14 power signal derived from the dc second signal, wherein
15 the output power signal and has an output frequency
16 independent of the input frequency and further has an
17 output voltage independent of the input voltage, and
18 wherein the means for providing an output power signal
19 is disposed to receive the dc second signal;

20 means for converting the dc second signal
21 into control power, wherein the control power has a
22 control power magnitude independent of the input
23 magnitude.

1 22. The apparatus of claim 21, wherein the first
2 means includes means for rectifying an ac signal.

1 23. The apparatus of claim 22, wherein the
2 convertor magnitude is greater than the first magnitude.

1 24. The apparatus of claim 23, wherein the
2 converting means includes means for boost converting the
3 first signal.

1 25. The apparatus of claim 24, wherein the means
2 for boost converting includes means for slow voltage
3 switching and slow current switching a switch.

1 26. The apparatus of claim 25, wherein the means
2 for providing an output power signal includes means for
3 inverting the dc second signal.

1 27. The apparatus of claim 26 wherein the means
2 for inverting includes means for switching a snubber.

1 28. The apparatus of claim 27, wherein the
2 converter magnitude is greater than the control power
3 magnitude.

1 29. The apparatus of claim 28 wherein the means
2 for converting the dc second signal into control power
3 includes means for buck converting the dc second signal.

1 30. A welding type power source capable of
2 receiving a range of input voltages and frequencies,
3 comprising:
4 a dc bus;
5 an output circuit configured, having a
6 control input and to receive the dc bus and provide a

7 welding type output power signal having an output
8 frequency independent of the input frequency and having
9 an output voltage independent of the input voltage;
10 a controller, connected to the control input
11 and further having a controller power input; and
12 a control power circuit configured to receive
13 the dc bus and provide a control power signal to the
14 controller power input.

1 31. The apparatus of claim 30, wherein the output
2 circuit includes an inverter.

1 32. The apparatus of claim 31, wherein the output
2 circuit includes a switched snubber.

1 33. The apparatus of claim 30, wherein the dc bus
2 has a magnitude is greater than a magnitude of the control
3 power signal.

1 34. The apparatus of claim 30 wherein the control
2 power circuit includes a buck converter.

1 35. A method of providing welding type power from
2 a range of input voltages and frequencies, comprising:
3 receiving a dc bus having a dc magnitude;
4 providing an output power signal derived from
5 the dc bus, wherein the output power signal is a
6 welding type output; and
7 converting the dc bus into control power,
8 wherein the control power has a control power magnitude
9 independent of the dc magnitude; and
10 providing the control power to a controller
11 configured to control the output power.

1 36. A method of starting to provide welding type
2 power from a range of input voltages and frequencies,
3 comprising:
4 receiving an input power signal having an
5 input frequency and an input magnitude;
6 providing a first dc signal having a first dc
7 magnitude responsive to the input magnitude;
8 deriving a second dc voltage having a second
9 dc magnitude less than the first dc magnitude
10 controlling a control converter with the
11 second dc voltage to produce a control dc voltage;
12 controlling an output converter with the
13 control dc voltage to produce an output signal.